The Relationship between Mental Toughness and Affect Intensity

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Abstract

Mentally tough athletes are conceptualized as being able to function effectively in stressful situations and recent research has found small to moderate correlations between mental toughness and coping. Despite this no research has thus far examined the possibility that mentally tough athletes experience less intense emotions. This paper tested the relationship between mental toughness and affect intensity to determine whether mentally tough athletes generally experienced more or less intense emotions. A sample of 112 sport performers (55 men and 57 women) aged between 18 and 51 years (M = 29.3, *s* = 10.3) acted as participants, and ranged from recreational to national level in a variety of sports. Mental toughness and affect intensity were found to be unrelated. This is an important finding because it suggests participants with high or low levels of mental toughness do not characteristically experience more or less intense emotions. Thus there is no evidence to suggest the ability of mentally tough athletes to remain relatively unaffected by pressure or adversity is due to lower levels of affect intensity. More research is required to understand how mentally tough athletes (in comparison to less tough athletes) maintain control and high levels of performance in stressful circumstances.

Introduction

Until recently, the literature on mental toughness has suffered from a number of inherent weaknesses, and was generally characterized by a lack of conceptual clarity (Crust, 2007; Jones, Hanton, & Connaughton, 2002). Mental toughness has been described as one of the most overused, but least understood terms in applied sport psychology (Jones et al., 2002). However, a recent surge of interest, and more rigorous scientific investigations into what is potentially one of the most important psychological attributes in sport, has led to somewhat greater clarity (Crust, 2007). Emerging research suggests that mental toughness is multi-faceted, and an important psychological construct that is related to successful sport performance (Bull, Shambrook, James, & Brooks, 2005; Crust & Clough, 2005; Clough, Earle, & Sewell, 2002; Gucciari, Gordon, & Dimmock, 2008; Jones, Hanton, & Connaughton, 2007).

Despite researchers such as Jones et al. (2002, 2007) and Clough et al. (2002) using different approaches (both qualitative and quantitative) to study mental toughness, Crust (2008) highlights numerous similarities in the outcomes of these and other studies. For example, Clough et al. proposed the 4C's model of mental toughness comprising of: (1) control (emotional and life), which concerns a tendency to feel and act as if one is influential, (2) commitment, which reflects deep involvement with whatever one is doing, (3) challenge, the extent to which individuals seek out opportunities for personal development, (4) confidence (in abilities and interpersonal), reflecting a high sense of self belief and an unshakeable faith in having the ability to achieve success. Similarly, Jones et al. (2007) reported attributes of mental toughness to include awareness and control of thoughts and feelings, and staying focused (comparable to control), using long-term goals

as a source of motivation (analogous to commitment), pushing to the limit (similar to challenge) and having an unshakeable self-belief (comparable to confidence). According to Crust (2007), other important attributes that characterize mental toughness include coping effectively with pressure and adversity, recovering or rebounding from set-backs and failures, persisting or refusing to quit, being insensitive or resilient, thriving on pressure and possession of superior mental skills. In support of their own model of mental toughness, Clough et al. (2002, p.38) suggested:

> Mentally tough individuals tend to be sociable and outgoing; as they are able to remain calm and relaxed, they are competitive in many situations and have lower anxiety levels than others. With a high sense of self-belief and an unshakeable faith that they can control their own destiny, these individuals can remain relatively unaffected by competition or adversity.

The definition of Clough et al. (2002) emphasizes mental toughness as a stress buffer that is influential in pressurized and adverse situations. However, recent researchers have suggested that defining mental toughness in terms of reactions or responses to adversity is somewhat limiting as the construct appears to encompass enabling factors that help to maintain focus and motivation when things are going well (Gucciari et al., 2008). There is still much debate concerning whether mental toughness is more stable and trait-like, or a set of context specific cognitive skills that can be manipulated through training (cf. Crust, 2008). Jones et al. (2007, p. 247) suggest mental toughness may be ‘natural or developed’ which appears to correspond with more recent understanding of the importance of both nature and nurture (cf. Golby & Sheard, 2006). Recent research has shown significant increases in the mental toughness of elite adolescent swimmers in response to a

7-week psychological skills training programme (Sheard & Golby, 2006) although it remains likely that mental toughness is at least partially inherited. Recent research that studied adult monogygotic and dizygotic twins (Horsburgh, Schermer, Vesleka, & Vernon, 2009) has revealed that individual differences in mental toughness were largely attributable to genetic and non-shared environmental factors.

One of the most important attributes of mentally tough athletes appears to be the avoidance of performance decrement due to damaging negative emotions and subsequent loss of focus, through the maintenance of psychological control in adverse circumstances or pressure situations (Bull et al., 2005; Clough et al., 2002; Crust, 2007; Golby, Sheard & van Wersch, 2007; Jones et al., 2002). A number of researchers have specifically emphasized the importance of emotional control (Clough et al., 2002; Loehr, 1995) which appears to reflect self-regulation, keeping emotions such as anxiety in check, and not revealing ones emotions to other people. Emotional control appeared to be what Clough et al. had in mind when manipulating feedback given to participants with high and low levels of mental toughness. These researchers evaluated mental toughness with their own inventory (MTQ48) and gave either positive or negative feedback to participants following a battery of physical tasks. These researchers reported a significant interaction between mental toughness and feedback when testing the performance of participants on a follow-up cognitive planning task. The performance of participants who scored high on the MTQ48 remained constant regardless of feedback, while participants with lower MTQ48 scores showed more variable responses that appeared to correspond to the type of feedback given (positive or negative). Specifically, participants with lower MTQ48 scores performed significantly worse on a cognitive planning task following negative feedback.

One explanation of these findings concerns the typical reactions of participants to emotion-provoking stimuli. In essence, the possibility remains that based on levels of mental toughness, participants interpret the feedback differently, and this likely influenced attention, and subsequent task performance. Other than recent research that found small but significant positive correlations between mental toughness and approach coping strategies, and negative correlations with avoidance coping (Nicholls, Polman, Levy & Backhouse, 2008), little is known about the specific cognitive processes that are related to mental toughness, and whether differences exist between individuals with high or low levels of mental toughness. However, Crust and Azadi (in press) recently examined the relationship between mental toughness and athletes' use of psychological strategies, using the MTQ48 to measure mental toughness and the Test of Performance Strategies (TOPS; Thomas, Murphy & Hardy, 1999) to evaluate use of psychological strategies. Crust and Azadi found significant and positive correlations between mental toughness and use of a number of psychological strategies including self-talk, relaxation and emotional control.

Outside of sport, Larsen and colleagues (Larsen, Diener & Emmons, 1986; Larsen, Diener & Cropanzano, 1987) have studied individual differences in emotional responses to identical emotion-provoking stimuli. These researchers found that some individuals consistently manifest stronger or more intense emotional responses than do others, and refer to this individual difference dimension as affect intensity. Larsen et al. (1986) had 62 undergraduate students report two events per day, and their affective responses to these events over an 8-week period. A team of coders was used to objectively determine how good or bad each event was. In a second study, the same researchers asked 187 participants to describe how they would react to standardized life event descriptions. In both studies

participants completed the Affect Intensity Measure (AIM; Larsen, 1984) and were divided into high and low affect intensity groups on the basis of their responses. In both studies, participants with high levels of affect intensity responded to actual and hypothetical events with significantly more intense affective reactions.

Larsen et al. (1987) provided empirical support to explain differences in affect intensity based upon underlying cognitive operations. Undergraduate psychology students (n = 280) were categorized as either high or low in affect intensity based on responses to the AIM (Larsen, 1984). Participants viewed affect-relevant slides and were asked to complete a questionnaire to assess the cognitive operations that were undertaken in evaluating the positive and negative images. Specifically, individuals with high affect intensity tended to engage in more personalizing (i.e., absorbed in personal meaning), generalizing (i.e. blowing things out of proportion) and selective abstraction (i.e. focus on emotional aspects of events).

Some researchers such as Cooper and McConville (1993) have questioned the validity of the construct and suggested affect intensity actually reflects a mixture of trait neuroticism and extraversion. However, such arguments are not convincing given that neuroticism and extraversion together predict less than 30% of the variance in measures of affect intensity (cf. Schimmack & Diener, 1997). Schimmack and Diener provided strong evidence to suggest that affect intensity is a valid construct and cannot be reduced to extraversion and neuroticism in a series of studies evaluating affective responses of undergraduate psychology students to both real (via diaries detailing experienced emotions) and hypothetical situations. Schimmack and Diener found extraversion to correlate with the intensity of pleasant affect while neuroticism related to intensity of unpleasant affect.

Additionally, extraversion and neuroticism were negatively correlated and therefore could not explain significant and positive correlations between intensity of pleasant and unpleasant affect. These researchers suggested it was untenable to define individuals high in affect intensity as neurotic extraverts. These findings support the supposition that individuals who experience intense pleasant affect also tend to experience intense unpleasant affect. Schimmack and Diener found that affect intensity and affect frequency scores were largely unrelated and that affect intensity is best conceptualized as a disposition to react strongly to emotion-eliciting events.

Bull et al. (2005) suggest that one important facet of mental toughness is tough thinking, and propose that most applied sport psychology work focuses on developing this aspect. To these researchers, tough thinking represents the translation of more general character and attitudes into a competitive environment, with mentally tough performers able to apply tough thinking at critical moments. Indeed, maintaining perspective which appears central to tough thinking, seems to be diametrically opposite to the cognitive operations of individuals with high affect intensity, who tend to over-react to emotional stimuli by ‘blowing things out of proportion’. Given this, it is possible that mental toughness and affect intensity are negatively related, and this hypothesis was tested in the following research.

The purpose of the present study was to determine the relationship between mental toughness and affect intensity. It is possible that participants with low levels of mental toughness have to deal with greater emotional disturbance due to characteristically augmenting emotion-provoking stimuli. Thus, the ability of mentally tough individuals to remain unaffected by competition or adversity could in part be explained by having less

intense emotional reactions (thus less cognitive disturbance), rather than (or as well as) having developed or learned more effective coping strategies. If mental toughness and affect intensity are found to be related, then future researchers will have an established theoretical base from which to proceed in evaluating the cognitive operations of mentally tough individuals.

Method

Participants

The sample consisted of 112 sport participants (55 men and 57 women) who regularly (at least twice per week) attended various sports and fitness clubs / activities at a university in the north of England. The heterogeneous sample included basketball, association football, hockey, gymnastics, netball, badminton, golf, long distance running and triathlon participants, who ranged from recreational sport participants to national level athletes. Recently there have been calls to study mental toughness among cohorts of varying sporting backgrounds and abilities (Crust, 2008; Gucciardi et al., 2008) rather than continuing to focus upon elite athletes. A mixed sample was deemed appropriate in order to more fully understand potential relationships within a broader population. The use of a heterogeneous sample appears to be similar to the recent approach taken by Nicholls et al. (2008). The mean age of men and women were found to be 30.1 years (s = 11.6) and 28.6 years (s = 8.9) respectively, with participants ages ranging from 18-51 years. The participants had all been participating in a minimum of two sports sessions a week, for at least six months.

Instruments

Mental Toughness

The MTQ48 (Clough et al., 2002), was used to measure mental toughness. Responses are made to the 48-items on a 5-point Likert scale ranging from (1) strongly disagree, to (5) strongly agree, with an average completion time between 10 and 15 minutes (Crust & Clough, 2005). The MTQ48 has an overall test-retest coefficient of 0.9. In the present study, overall Cronbach's Alpha for the MTQ48 (0.86) was found to be consistent with previous research (Nicholls et al., 2008). More recently, researchers have reported the MTQ48 to have adequate psychometric properties, and both exploratory and confirmatory factor analysis has been found to support the proposed structure of the inventory (Horsburgh, et al., 2009). Clough et al. (2002) have provided evidence for the construct validity of the MTQ48 with significant relationships reported with optimism, self-image, life satisfaction, self-efficacy, and trait anxiety. In respect of criterion validity, Clough et al. found that participants with self-reported high, as opposed to low mental toughness gave lower rating of exertion during a 30-minute physically demanding cycling task. The MTQ48 has been found to correlate with pain tolerance (Crust & Clough, 2005) and a short version of the questionnaire has been shown to relate to injury rehabilitation (Levy, Polman, Clough, Marchant & Earle, 2006) with more positive threat appraisals, better coping with pain, and greater attendance at rehabilitation clinics associated with higher levels of mental toughness.

Affect Intensity

To determine levels of emotional reactivity, the Affect Intensity Measure (AIM-Larsen, 1984) was completed by each participant. This 40-item inventory assesses the characteristic intensity with which an individual typically experiences emotions. Items are rated on a 6-point scale, with verbal anchors ranging from (1) never, to (6) always, with scoring achieved by averaging the responses across the 40-items. Larsen (1984) reported high coefficient alpha (Cronbach, 1951) for the AIM across four samples (0.9 – 0.94). In respect of construct validity, Larsen also reported a significant correlation $r = 0.5$ ($p<0.01$) between Affect Intensity and reports of typical affect response intensity by the parents of participants. The AIM has also been found to correlate significantly ($r = 0.52$-0.61) with the average intensity of daily moods assessed over several months, and with measures of peripheral physiological arousal ($r = -0.32$) which suggest high-AIM participants are physiologically under aroused in quiet, stimulus reduced environments (cf. Larsen et al., 1986). Tests of stability (test-retest correlations) after 1-, 2-, and 3 months were found to be 0.8, 0.81 and 0.81 respectively. Larsen et al. (1986) reports that across several samples, the AIM has been found to correlate most consistently with sociability, arousability, and emotionality.

Procedures

A variety of coaches and instructor s at a north of England University were approached in order to gain permission to solicit volunteers for the present research. The largest group of participants was drawn from a circuit training class that included a wide variety of sport and exercise participants, and a large number of sports participants who were using the session to maintain or increase their sport-related fitness. Instructors gave permission for

participants to be sought, and allowed the author to address the group prior to training classes. The aims and objectives of the research were briefly stated, and issues of confidentiality were broached. This approach led to 112 volunteers agreeing to participate in the present study. All participants read, and signed informed consent forms prior to completing a booklet containing a copy of the MTQ48 (Clough et al., 2002) and the AIM questionnaire (Larsen, 1984). Completed booklets were placed into envelopes, sealed, and collected by the instructor or the author. Ethical clearance for this research was achieved through a University research ethics committee.

Data Analysis

To test the relationship between mental toughness and affect intensity, Pearson Product Moment Correlations were computed between affect intensity, overall mental toughness and the six subscales of the MTQ48 questionnaire. Correlations were also computed to assess any relationship between mental toughness, affect intensity and age. Finally, independent *t*-tests were used to test for possible gender differences, and differences relating to performance levels of the participants in mental toughness and affect intensity. Data screening was used to ensure all dependent variables met the assumptions necessary for the use of parametric statistics.

Results

Descriptive data for responses to the MTQ48 and AIM questionnaire can be viewed in Table 1. Measures of skewness and kurtosis found the data to be normally distributed. A series of Pearson correlations between affect intensity, overall mental toughness, and the

six subscales of mental toughness found no significant ($p > .05$) relationships (cf. Table 2). Age was also found to be unrelated to mental toughness ($r = -.15$, $p > .05$) and affect intensity ($r = -.11$, $p > .05$). Independent *t*-tests found no significant differences ($p > .05$) in overall mental toughness, the mental toughness subscales or affect intensity between men and women. Finally, a series of independent *t*-tests were used to test for differences in mental toughness and affect intensity between recreational athletes ($n = 49$), and athletes who had competed at club level or higher ($n = 63$). Bonferroni corrections were used to adjust *p* values because of using multiple comparisons and no significant differences were found between recreational or club level athletes.

Discussion

The aim of this research was to test the hypothesis that mental toughness and affect intensity were significantly and negatively related. Previous research has not excluded the possibility that mentally tough athletes are able to remain calm in pressurized situations due to experiencing less intense emotions. Results suggest that mental toughness and affect intensity are not linearly related. In the context of developing a greater understanding of mental toughness, this is an important finding. If mental toughness and affect intensity were found to negatively correlate, then the possibility would have remained that mentally tough individuals experienced less intense emotions in response to a given level of emotion provoking stimuli; which might have explained the ability of such individuals to remain relatively unaffected by pressure or adversity. However, the present findings coupled with previous evidence of a relationship between mental toughness and coping (Nicholls et al., 2008), and mental toughness and use of psychological strategies (Crust & Azadi, in press)

appears to give some credence to those researchers and theorists (Clough et al., 2002; Loehr, 1995) who contend that emotional control is a vital component of mental toughness. If mentally tough athletes have similarly intense emotional experiences as other athletes, it appears appropriate to examine if, and how mentally tough athletes differ in the way they manage their emotions. However, given that the present study did not assess emotional control or coping it is clear that further research will be necessary to confirm the importance of such factors as other potential causal explanations remain possible.

If mentally tough individuals do not characteristically experience differences in affect intensity, it is possible that such individuals are exerting more effective control over experienced emotions. This could implicate a number of possible mechanisms such as attention, differences in cognitive operations or more general coping strategies, although it is possible that these explanations are not mutually exclusive. In relation to attention, Jones et al. (2007) reported mentally tough athletes to totally focus on the task at hand, remain committed to a self-absorbed focus, and focus on processes not solely outcomes. Directing attention is such ways is likely to avoid being distracted by pleasant or unpleasant recent experiences. Furthermore, the view that cognitive operations might be one explanation of emotional control is supported in a recent study (Crust & Azadi, in press) that employed the MTQ48 and the Test of Performance Strategies (TOPS; Thomas et al., 1999). Crust and Azadi found significant correlations between mental toughness and use of a number of psychological strategies including self-talk, relaxation and emotional control. Unfortunately, the emotional control subscale of the TOPS does not reflect how participants achieved control.

The recent work of Nicholls et al. (2008) appears to suggest some relationships between mental toughness and the use of problem or approach coping strategies (mental imagery, effort expenditure, thought control, and logical analysis), although only modest correlations were reported (highest $r = 0.3$ between mental toughness and logical analysis). In recent research concerning mental toughness in Australian Football, elite coaches with significant playing experience highlighted the importance of 'the ability to manage your emotions to enhance performance' (Gucciardi et al., 2008, p. 272). Furthermore, Crust, Nesti and Bond (2008) reported that mentally tough long-distance walkers showed a flexible approach to coping (using strategies interchangeably to suit the circumstances) and employed strategies such as compartmentalizing the problem, objective thinking, and maintaining perspective.

If the goal of the practitioner is to intervene and help individuals develop mental toughness, then a greater understanding of the cognitive operations underlying the concept is required. However, recent research concerning psychological resilience might offer an appropriate framework and theoretical perspective in which to further understand mental toughness and any relationship with emotions. Tugade, Fredrickson, and Feldman-Barrett (2004) suggest that resilient individuals tend to be better at harnessing positive emotions in times of stress and thus reap beneficial effects in relation to coping. These researchers considered psychological resilience in context of the broaden-and-build theory of positive emotions (Fredrickson, 1998), which suggests that positive (as opposed to negative) emotions can momentarily allow broader thinking, flexible attention, and thus more varied behavioral repertoires. Tugade et al. (2004) found that resilient individuals were not blind to negativity and did experience high levels of anxiety and frustration yet were able to

experience positive emotions during stressful circumstances. It is suggested that with repeatedly experiencing positive emotions, a broadened mindset becomes habitual and helps to build an individual's personal resources. Efforts to consider mental toughness in the context of the broaden-and-build theory are likely to complement existing work that has explored the relationship between mental toughness and coping (Nicholls et al., 2008).

It is interesting to note that no significant differences were found between men and women in regards to overall levels of mental toughness or affect intensity. This concurs with Clough et al. (2002) who reported that the MTQ48 did not discriminate across gender. Descriptive data for measures of mental toughness and affect intensity appear to be similar to previously reported normative data. With respect to affect intensity, the reported mean in the present research (3.7) is within the normal range reported by Larsen et al. (1987). The mean mental toughness rating (173) is consistent with the findings of Nicholls et al. (2008).

Although some researchers or theorists might criticize the use of a heterogeneous sample in this study, there is certainly a need to broaden out the study of mental toughness, given past researcher's over-emphasis on studying elite performers (cf. Crust, 2008). Indeed, while existing research has highlighted the characteristics of elite mentally tough athletes, there have been few attempts to establish if such characteristics reliably differentiate between athletes with high or low levels of mental toughness, or the relationship with non-elite athletes. In essence, much of the existing work is primarily descriptive, and does not allow for a thorough understanding of the concept.

While the findings of the present study suggest mentally tough athletes do not characteristically experience less intense emotions when compared to less tough athletes, further research is required to confirm this given a relatively small sample size and a

number of other limitations. For example, the present research employed self-report measures that required participants to reflect on typical or general responses. However, it remains possible that participant responses could be different when faced with real or hypothetical scenarios that demand mental toughness. Future researchers might consider assessing the intensity of emotional responses in athletes found to have higher and lower levels of mental toughness using demanding imagined scenarios. Furthermore, given that advances in understanding anxiety responses in sport have been facilitated by investigating not only the intensity of response but also the direction (i.e. facilitative versus debilitative) such an approach (cf. Hanton, Neil & Mellalieu, 2008) might be employed to further understand the relationship between mental toughness and affective responses. It may be that direction rather than intensity scores are better able to distinguish between individuals with higher or lower levels of mental toughness.

This present research found no significant linear relationships between mental toughness and affect intensity. This finding suggests individuals with high as opposed to low levels of mental toughness do not experience emotions more or less intensely. At present, there is no evidence to suggest the ability of mentally tough athletes to retain control in adverse or pressurized situations is due to such athletes having less intense emotional experiences. To further understand how mentally tough athletes remain relatively unaffected by competition or adversity future researchers should test for differences between individuals with high and low levels of mental toughness in areas such as focus, cognitive processing, decision-making and coping strategies.

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Table 2 – Pearson Product Moment Correlations between Mental Toughness and Affect Intensity

	Mental Toughness	Challenge	Commitment	Emotional Control	Life Control	Ability Confidence	Interpersonal Confidence	Affect Intensity
Mental Toughness		.76**	.72**	.67**	.74**	.79**	.58**	.06
Challenge			.45*	.54**	.44**	.48**	.33**	.10
Commitment				.36*	.45**	.42*	.29**	.06
Emotional Control					.45**	.43**	.15	-.03
Life Control						.50**	.37**	.10
Ability Confidence							.47**	-.03
Interpersonal Confidence								.07
Affect Intensity								

*$P < .05$; **$P < .01$